Lecture Module - Introduction

ME3023 - Measurements in Mechanical Systems

Mechanical Engineering

Tennessee Technological University

Topic 3 - Experimental Test Plan

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- Parameter Design Plan
- System and Tolerance Design Plan
- Data Reduction Design Plan
- Experimental Design Strategies

Parameter Design Plan

Parameter Design Plan: Determine the test objective and identify the process variables and parameters and a means for their control.

Ask:

- What question am I trying to answer?
- What needs to be measured?
- What variables and parameters will affect my results?

Text: Theory and Design of Mech. Meas.

System and Tolerance Design Plan

System and Tolerance Design Plan: Select a measurement technique, equipment, and test procedure based on some preconceived tolerance limits for error.

Ask:

- In what ways can I do the measurement?
- How good do the results need to be to answer my question?

Text: Theory and Design of Mech. Meas.

Data Reduction Design Plan

Data Reduction Design Plan: Plan how to analyze, present, and use the anticipated data.

Ask:

- How will I interpret the resulting data?
- How will I use the data to answer my question?
- How good is my answer?
- Does my answer make sense?

Text: Theory and Design of Mech. Meas.

Experimental Design Strategies

- Randomized Tests
- Repetition and Replication.
- Concomitant Methods